

Field Trial Report

Effect of EnergHi, Gibboost and Liquid N on pasture growth

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Trial Outline

One small plot replicated field trial was conducted in Canterbury between August and November 2018 to determine the activity of EnergHi when used in combination with Gibberellic Acid and Liquid N (dissolved urea) on pasture growth.

The trial was established as a randomised complete block design with six replicates. Plot sizes were 10m x 1.5m. The trial area was pre-mown before each application to ensure a uniform starting point and was left for 5-7 days to regrow and 'freshen up'. All treatments were applied as a liquid using a knapsack CO₂ sprayer incorporating three Hardi MD02 air induction flat fan nozzles at an application pressure of 280 kPa on a boom with 50cm spacing's.

Yields were assessed by mowing a single strip up the length of each plot using a commercial rotary lawn mower. The mowing strip was approximately 51cm wide. Subsamples were taken from each mown strip and sent to Hill Labs in Christchurch to ascertain dry matter levels.

9.00am (10cm) soil temperatures (taken from the closest research station – Lincoln) during the trial period ranged from 3.1°C (8th August) to 15.4°C (25th October).

Table 1: Trial details

Farmer:	
Location:	Edwards Road, Rolleston, Canterbury
Crop:	Irrigated Perennial Ryegrass & White Clover pasture
Application dates:	3 rd August, 6 th September, and 15 th October 2018
Measurement dates:	31 st August, 5 th October, and 5 th November 2018

Table 2: Treatment details and application rates

Product	Urea rate	Gibb Acid rate	EnergHi rate
1. Control	-	-	-
2. Gibboost	-	9g/ha	-
3. EnergHi	-	-	25ml/ha
4. Gibboost + EnergHi	-	9g/ha	25ml/ha
5. Gibboost + Nitrogen	45kg/ha	9g/ha	-
6. EnergHi + Nitrogen	45kg/ha	-	25ml/ha
7. Nitrogen	45kg/ha	-	-
8. Gibboost + EnergHi + N	45kg/ha	9g/ha	25ml/ha

Dry matter production results

When applied alone, Gibberellic Acid (Gibboost) and Nitrogen (Liquid N), significantly increased pasture production at all three harvests (table 3.) and for total yield (table 4.). When combined (Gibboost + N) the level of pasture production significantly increased further.

EnergHi applied on its own, had no effect on pasture production. When combined with Nitrogen, a significant lift in pasture production was seen. However, this lift in production was no greater than Liquid N applied on its own, indicating that it was a Liquid N effect causing the increased pasture growth.

When EnergHi and Gibberellic Acid were combined, significant production benefits were seen at the final harvest and for total yield. Again, this increase in pasture production was no greater than Gibberellic Acid on its own, indicating that any positive yield effect was caused by the Gibberellic Acid.

A highly significant increase in pasture production was seen when Gibberellic Acid, EnergHi and Liquid N were applied together. This combination significantly increased pasture production at all three harvest dates and for total yield. The lift in pasture production was significantly greater than the combination of just Gibberellic Acid and Liquid N (except for harvest 1).

Table 3. Effect of treatments on pasture dry matter production.

Treatment	31/08/18 Yield (kgDM/ha) grown	05/10/18 Yield (kgDM/ha) grown	05/11/18 Yield (kgDM/ha) grown
Control	660 d	1788 e	1722 g
Gibboost	909 bc	2194 cd	2256 e
EnergHi	653 d	1669 e	1825 fg
Gibboost + EnergHi	817 bcd	1960 de	1967 f
Gibboost + N	1174 a	2758 b	3183 b
EnergHi + N	724 cd	2489 bc	2860 c
N	888 bc	2440 bc	2633 d
Gibboost + EnergHi + N	1004 ab	3214 a	3441 a
F Test	***	***	***
CV%	21.0517	12.3281	6.1114
LSD 5% level	209.6896	332.8675	177.2869
Trial Mean (kgDM/ha)	853.6250	2313.9375	2486.0833
Standard Error:	103.7515	164.6982	87.7191

a,b,c values sharing the same letter within a column did not differ statistically significantly from each other at the 95% confidence level.

SEM standard error of the means for comparisons between permutations of treatments (GLM analysis)
SE standard error for each of the individual components (GLMM mixed models analysis)

Table 4. Effect of treatments on pasture dry matter production – mean total growth over trial period.

Treatment	Total Yield (kgDM/ha) grown
Control	4171 f
Gibboost	5359 d
Triacantanol	4147 f
Gibboost + Triacantanol	4745 e
Gibboost + N	7115 b
Triacantanol + N	6073 c
N	5961 c
Gibboost + Triacantanol + N	7659 a
F Test	***
CV%	7.6933
LSD 5% level	507.5345
Trial Mean (kgDM/ha)	5653.6458
Standard Error:	251.1210

a,b,c values sharing the same letter within a column did not differ statistically significantly from each other at the 95% confidence level.

SEM standard error of the means for comparisons between permutations of treatments (GLM analysis)
SE standard error for each of the individual components (GLMM mixed models analysis)

Conclusion

The addition of EnergHi to Gibberellic Acid and Liquid N provided significant pasture production benefits. The lift in pasture production when EnergHi was added to this combination was highly evident throughout the trial and provided over 500kg/ha extra pasture growth over the trial period.

The addition of Liquid N to Gibberellic acid is a common practice on New Zealand pastoral farms, as it has been proven that the addition of Liquid N further enhances pasture production. This was again shown in this trial.

However, the addition of EnergHi to this mix further enhances pasture production, providing a valuable tool that farmers can use to improve production levels.

Trial site set up – October 2018

